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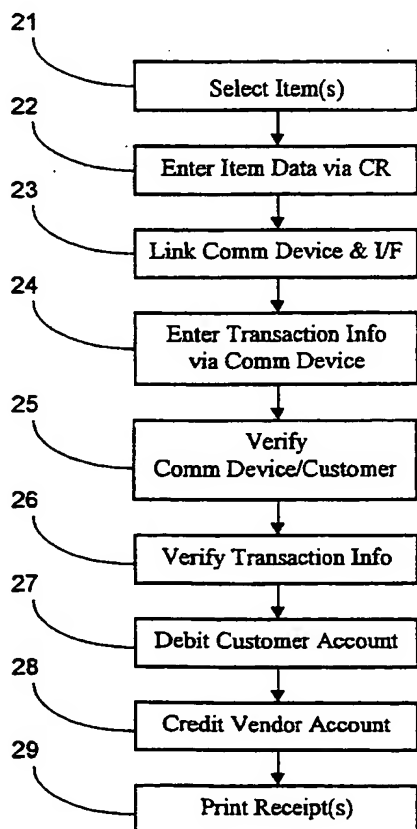
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[Continued on next page]

(54) Title: ELECTRONIC TRANSACTION SYSTEM

21 — Select Item(s)

22 — Enter Item Data via CR

23 — Link Comm Device & I/F

24 — Enter Transaction Info via Comm Device

25 — Verify Comm Device/Customer

26 — Verify Transaction Info

27 — Debit Customer Account

28 — Credit Vendor Account

29 — Print Receipt(s)

(57) Abstract: A method and system for effecting electronic transactions between a vendor and a customer with no transaction size limitation and wherein the transaction is performed via the customer's communications device and the associated communications service provider, with no need for the customer to provide a separate identifying card such as a credit card.

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Electronic Transaction System

FIELD OF THE INVENTION

The present invention relates generally to transaction verification and billing systems.

BACKGROUND OF THE INVENTION

Electronic transactions, such as those performed via credit and debit cards, have become common. Clearly, it is of great convenience to customers if they need not carry large amounts of cash. One limitation often encountered by customers, however, is the size of the transaction. Credit card companies typically have a minimum transaction value that they will accept. Transaction size limitations are also imposed by vendors, because of transaction fees they must pay to credit card companies. Many small retail businesses, for example, grocery stores, may not accept credit cards for this reason. Both vendors and customers would benefit from the ready availability of electronic transactions with no size limitation.

A logical extension of the convenience to a customer of not carrying cash would be not to need to carry credit cards at all. The so-called "electronic wallet" was to be a step in that direction, wherein one smartcard would replace cash and a collection of credit cards, but it has not gained wide acceptance, perhaps because of the need for a mechanically intricate, and therefore, expensive, reader and interface.

A convenient means to effect cashless transactions of any size, acceptable to both vendors and purchasers, would be valuable to both and would encourage increased trade.

Electronic transactions have been addressed by a number of existing patents, for example, U.S. Patent Numbers 5,892,891, 5,903,830, 5,805,719, and 5,557,518, but the issues addressed are enhanced security and verification systems and methods in using credit and debit cards or the like, or in accessing computer systems. U.S. Patent Number 5,204,902 teaches a cellular telephony authentication arrangement which is merely a security arrangement for use of cellular telephone communication.

SUMMARY OF THE INVENTION

The present invention seeks to provide a method and system for effecting electronic transactions between a vendor and a customer with no transaction size limitations and wherein the transaction is performed via the customer's communications device and the associated communications service provider, with no need for the customer to provide a separate identifying card such as a credit card.

There is thus provided, in accordance with a preferred embodiment of the invention, a method of effecting a transaction between a vendor and a customer which includes the following steps:

selecting at least one item for purchase;

entering item-associated data into a cash register associated with the vendor;

establishing a communications link between a mobile telephone unit associated with the customer and a telephone interface device connected between the cash register and a telephone line associated with the vendor;

entering, via a data entry device associated with the mobile telephone unit, customer validating information and transaction information, including a transaction sum;

verifying customer validating information and the transaction information; and

debiting the mobile telephone account of the customer and crediting a preselected vendor account by an amount corresponding to the transaction sum.

Further, in accordance with a preferred embodiment of the present invention, the step of verifying transaction information includes the substep of comparing the item-associated data entered into the cash register with analogous transaction data entered via the mobile telephone unit.

Additionally, in accordance with a preferred embodiment of the present invention, the method includes, after the step of crediting, the step of providing a readable confirmation of the transaction to the customer and, if required, to the vendor.

Further in accordance with a preferred embodiment of the present invention, the step of establishing a communications link includes the substeps of:

contacting, via the mobile telephone unit, the telephone line associated with the vendor;

entering, via a data entry device associated with the mobile telephone unit, a transaction code to identify the call as a transaction call; and

routing the identified transaction call to the telephone interface device.

Additionally, the step of establishing includes the substeps of either: retrieving, from the selected cash register connected with the telephone interface device, or entering, via a data entry device associated with the mobile telephone unit, a code identifying a selected cash register on which said step of entering item-associated data was performed, and verifying, via the code identifying a selected cash register, that the selected cash register is associated with the telephone interface device.

There is further provided, in accordance with a preferred embodiment of the present invention, a telephone interface device connecting a cash register and a telephone associated with the vendor from whom a customer has selected an item or items for purchase and a system employing the telephone interface device, for performing the abovementioned method of enacting a transaction a vendor and a customer, by means of a communications device associable with a communications service provider associated with the customer, which includes:

a cash register associated with the vendor; and

the telephone interface device which is connected between the cash register and a telephone associated with the vendor.

The telephone interface includes:

a front end module to route incoming calls on the phone line associated with the vendor and

a processing module for processing transaction calls which includes: a data processor, a data storage device, and programs for processing transaction-associated data and customer validating data and for generating transaction commands.

In accordance with a preferred embodiment of the present invention, the telephone interface device is operative, via the processing module, to perform the following operations:

receive and store, in the data storage device, item- and transaction-associated data, including a transaction sum, from the cash register;

receive, via the phone line associated with the vendor, customer validation data, for customer authorization either by verifying the customer validation data or by receiving a customer validation code generated by a communications service provider via the phone line associated with the vendor, and transaction data, including a transaction sum, from the communications device associated with the customer;

verify the transaction data by comparing it to the item-associated data from the cash register; and

generate and send transaction codes to debit a communications services account with the communications service provider associated with the customer and to credit a preselected vendor account by an amount corresponding to the transaction sum.

Additionally in accordance with a preferred embodiment of the present invention, the front end module is further operative to recognize transaction-associated calls coming from the communications device associated with the customer and pass them to the processing module of the telephone interface device for processing and to route all other calls to a fixed wire telephone unit associated with the vendor. The telephone interface device is further operative to generate, via the cash register, a readable confirmation of the transaction to the customer and, if required, to the vendor.

Further in accordance with a preferred embodiment of the present invention, the item-associated data and the transaction data include a code to identify the cash register, this code further serving to associate the cash register with the telephone interface device and to allow verification that the cash register is associated with the telephone interface device. Additionally, the vendor may have a number of cash registers which may each be associated with a telephone interface device or which may all be associated with one

telephone interface device; and this code serves to identify the specific cash register whereby the transaction is effected.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more fully understood and appreciated from the following detailed description taken in conjunction with the drawings, in which:

Figure 1 is a block diagram of a transaction system, constructed and operative in accordance with a preferred embodiment of the present invention;

Figure 2 is a flow chart of a transaction performed using the transaction system of Figure 1; and

Figure 3 is a flow chart of telephone call processing performed by the transaction system of Figure 1.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to Figure 1, there is shown a block diagram of a system, referred to generally as 10, for effecting a transaction between a vendor and a customer, constructed and operative in accordance with a preferred embodiment of the present invention. The transaction system 10 of the present invention has three parties to a transaction: a vendor 12, a customer 14, and a communications service provider 16. In a preferred embodiment of the present invention, communications service provider 16 is a cellular telephone service provider, but alternatively, it may be any communications service provider that can connect a user, in this case the purchaser, to a telephone, in this case that of the vendor; for example, a paging or other electronic message service. Vendor 12 has a cash register 122 which is connected to a telephone interface device in accordance with a preferred embodiment of the system 10 of the present invention. Customer 14 has a communications device 142, having associated therewith an account with a communications service provider 16. In a preferred embodiment of the present invention, communications device 142 is a cellular telephone with an associated telephone account with a cellular telephone

service provider 16, although it may be some other communication device that is associated with a communications service provider and that allows data input; for example, a paging device with a keypad or one that has voice recognition capability. In the following description, customer communications device 142 is referred to as a cellular phone or cellphone, but this is done strictly by way of example.

A method of effecting transactions between vendor 12 and customer 14, in accordance with a preferred embodiment of the present invention, is shown schematically in the flow chart in Figure 2. The step in the method of linking communication device and interface, referenced as 23, is shown in greater detail in the flowchart of Figure 3. In the following description, steps of the method shown in the flow charts in Figures 2 and 3 are indicated by reference numbers in parenthesis, while parts of the system shown in Figure 1 are followed by inline reference numbers.

In accordance with the present invention, after customer 14 has selected an item or items for purchase from vendor 12 (21), vendor 12 enters details of the item or items into cash register 122 as in any standard credit transaction (22). Customer 14 then uses cellular telephone 142 to call the telephone number of vendor 12 (23) (31) and enters a predetermined code, via the keypad of cellular telephone 142 to identify the call as a transaction call, as well as a password or personal identification number (PIN) for security and verification purposes. The cellular telephone service provider 16 system detects the transaction code (32) and validates cellular telephone 142 of customer 14 by verifying that the PIN entered is the correct one for the customer's cellular phone number (34). Transaction calls for which customer validation fails are simply not put through (35), i.e. connected, while calls without the transaction code are put through as standard calls (33).

Associated with the telephone line of vendor 12 is telephone interface device 124 which has a front end module 126, which may be implemented either in software or hardware, for receiving and routing all incoming calls and a processing module 125 for processing of transaction calls. Standard calls are routed to a fixed wire telephone 127 (33) which is located on the vendor premises, and calls identified as transaction calls are passed through to processing module 125 of telephone interface device 124 (23) (36), which includes data storage, a processor, and programs, for further processing of transaction calls.

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Processing module 125 of telephone interface device 124 is also associated with cash register 122 via both a physical connection and a cash register identification code to allow transactions and charges only from an authorized cash register 122 (37). If the cash register identification code does not match that authorized for processing module 125 of telephone interface device 124, no transaction calls will be processed (38). Alternatively, customer 14 enters, via cellular telephone 142 keypad, the cash register identification code for cash register 122 whereby the selected items are being purchased, and processing module 125 of telephone interface device 124 verifies that the entered code matches that for the cash register associated therewith. For a vendor having multiple cash registers, each cash register is provided with an identifying code which allows association with a particular telephone interface device 124 for processing transactions therefrom. In an alternative embodiment of the present invention, telephone interface device 124 may be associated with a plurality of cash registers, and the cash register identification codes allow proper accounting of transactions performed on different cash registers.

Once communication is established between purchaser cellular telephone 142 and telephone interface device 124 (23), so as to inherently authorize the cellular phone 142 for use in performing the transaction (25) via cash register 122 (39), customer 14 enters, via the keypad of cellular telephone 142 or by means of voice recognition input therewith, data about the current transaction (24), including at least the transaction sum. In an alternative embodiment of the present invention, customer 14 enters the transaction sum when making the call, together with the transaction code and the PIN, and, in the event of authorization, the transaction sum is passed through directly to telephone interface device 124. At the same time, the transaction data is passed from cash register 122 to telephone interface device 124, which compares it with the transaction data entered via cellular telephone 142 (26). If the sums for the transaction match, the transaction is authorized. Alternatively, additional transaction data may be compared and checked. Customer 14 may also be prompted to confirm the transaction via cellular telephone 142.

Telephone interface device 124 sends the authorized transaction amount and other details of the transaction as needed to communications service provider 16, which bills or debits the telephone account of customer 14 by an amount equal to the transaction sum

(27) and authorizes credit of an amount equal to the transaction sum to a preselected account 128 designated by vendor 12 for that purpose (28). In a preferred embodiment of the present invention, preselected vendor account 128, is a telephone account, to take advantage of the common practice of telephone service providers crediting and debiting multiple telephone service providers for calls and services provided and handled by a number of telephone service providers. Cash register 122 may also issue a printed receipt of the transaction for customer 14 and optionally for vendor 12 (29).

In practice, cellular communications provider 16 may, by prior agreement, collect fees from vendor 12 and possibly customer 14 for providing the above described transaction service. Customer 14 benefits from the convenience of being able to make purchases of any size through an existing account with communications service provider 16 and having all these transactions appearing on one statement from cellular telephone service provider 16. Vendor 12 benefits from increased business volume because of the ease of performing transactions, especially low value transactions which credit card companies do not normally handle.

It will further be appreciated, by persons skilled in the art, that the scope of the present invention is not limited by what has been specifically shown and described hereinabove, merely by way of example. Rather, the scope of the present invention is defined solely by the claims, which follow.

CLAIMS

1. A method of effecting a transaction between a vendor and a customer, including the steps of:

   selecting at least one item for purchase;

   entering item-associated data into a cash register associated with the vendor;

   establishing a communications link between a mobile telephone unit associated with the customer and a telephone interface device connected between the cash register and a telephone line associated with the vendor;

   entering, via a data entry device associated with the mobile telephone unit, customer validating information;

   entering, via a data entry device associated with the mobile telephone unit, transaction information, including a transaction sum;

   verifying customer validating information;

   verifying transaction information;

   debiting the mobile telephone account of the customer an amount corresponding to the transaction sum; and

   crediting a preselected vendor account by the amount corresponding to the transaction sum.

2. A method according to claim 1, wherein said step of establishing a communications link includes the substeps of:

   contacting, via the mobile telephone unit, the telephone line associated with the vendor;

   entering, via a data entry device associated with the mobile telephone unit, a transaction code to identify the call as a transaction call; and

   routing the identified transaction call to the telephone interface device.

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3. A method according to claim 1, wherein said step of verifying transaction information includes the substep of comparing the item-associated data entered into the cash register with analogous transaction data entered via the mobile telephone unit.

4. A method according to claim 1, said step of establishing further includes the substeps of:

   retrieving from the selected cash register connected with the telephone interface device a code identifying a selected cash register on which said step of entering item-associated data was performed;

   and verifying, via the code identifying a selected cash register, that the selected cash register is associated with the telephone interface device.

5. A method according to claim 1, said step of establishing further includes the substeps of entering, via a data entry device associated with the mobile telephone unit, a code identifying a selected cash register into which item-associated data was entered, and verifying, via the code identifying a selected cash register, that the selected cash register is associated with the telephone interface device.

6. A method according to claim 1, further including, after said step of crediting, the step of providing a readable confirmation of the transaction to at least one of the customer and the vendor.

7. A system for effecting a transaction between a vendor and a customer who has selected at least one item for purchase from the vendor, by means of a communications device associable with a communications service provider associated with the customer, including:

   at least one cash register associated with the vendor;

at least one telephone interface device connected between said at least one cash register and a telephone associated with the vendor, wherein each said telephone interface device includes:

a front end module to route incoming calls on the phone line associated with the vendor, and

a processing module for processing transaction calls which includes:

programs for processing transaction-associated data and customer validating data and for generating transaction commands;

a data processor for running said programs; and

a data storage device associated with said data processor for storing said programs and data required for processing transaction-associated data and customer validating data;

wherein said telephone interface device is operative, via said processing module, to:

receive and store, in said data storage device, item- and transaction-associated data, including a transaction sum, from said cash register;

receive, via the phone line associated with the vendor, customer validation and transaction data, including a transaction sum, from the communications device associated with the customer;

perform customer authorization in a predetermined manner;

verify said transaction data by comparing it to said item-associated data from said cash register; and

generate and send transaction codes to debit a communications services account with said communications service provider associated with the customer by an amount corresponding to the transaction sum and to credit a preselected vendor account the amount corresponding to the transaction sum.

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register is a code to identify a selected cash register from said multiplicity of cash registers whereby the transaction is effected.

13. A system according to claim 7, wherein said telephone interface device is further operative to generate, via said cash register, a readable confirmation of the transaction to at least one of the customer and the vendor.

14. A telephone interface device connected between a cash register and a telephone associated with a vendor from whom a customer, having a communications device associable with a communications service provider associated with the customer, has selected at least one item for purchase therefrom, which includes:

a front end module to route incoming calls on the phone line associated with the vendor and

a processing module for processing transaction calls which includes:

programs for processing transaction-associated data and customer validating data and for generating transaction commands;

a data processor for running said programs; and

a data storage device associated with said data processor for storing said programs and data required for processing transaction-associated data and customer validating data;

wherein said telephone interface device is operative, via said processing module, to:

receive and store, in said data storage device, item- and transaction-associated data, including a transaction sum, from said cash register;

receive, via the phone line associated with the vendor, transaction and customer validation data, including a transaction sum, from the communications device associated with the customer;

perform customer authorization in a predetermined manner;

verify said transaction data by comparing it to said item-associated data from said cash register; and

generate and send transaction codes to debit a communications services account with said communications service provider associated with the customer by an amount corresponding to the transaction sum and to credit a preselected vendor account the amount corresponding to the transaction sum.

15. A telephone interface device according to claim 14, wherein said telephone interface device is operative, via said front end module, to perform customer authorization in a predetermined manner that is selected from the group consisting of:

verifying said customer validation data; and

receiving, via the phone line associated with the vendor, a customer validation code generated by a communications service provider.

16. A telephone interface device according to claim 14, wherein said front end module is operative to recognize transaction-associated calls coming from the mobile phone unit associated with the customer and pass them to the processing module of said telephone interface device for processing and to route all other calls to a fixed wire telephone unit associated with the vendor.

17. A telephone interface device according to claim 14, wherein said item-associated data and said transaction data include a code to identify a selected cash register, said code further serving to associate said selected cash register with said telephone interface device and to allow verification that said selected cash register is associated with said telephone interface.

18. A telephone interface device according to claim 14, wherein said telephone interface device is further operative to generate, via said cash register, a readable confirmation of the transaction to at least one of the customer and the vendor.

Figure 1

Figure 2

3/3

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                    ┌──────────────────────┐  ⟍ 31
                    │   Call Vendor Phone   │
                    └──────────────────────┘
                              │
                              ▼
   32                        ╱╲
    ⟍                       ╱  ╲
         ╱────────────────╱      ╲────────────────╲         ┌──────────────────────┐  ⟍ 33
        ╱                                          ╲   N     │  Route Call to Regular │
       ╱           Includes Transaction Code?       ╲──────▶│        Phone          │
        ╲                                          ╱         └──────────────────────┘
         ╲────────────────╲      ╱────────────────╱
                           ╲    ╱
                            ╲  ╱
                             Y │
                              ▼
   34                        ╱╲
    ⟍                       ╱  ╲
         ╱────────────────╱      ╲────────────────╲         ┌──────────────────────┐  ⟍ 35
        ╱       Does Caller PIN                    ╲   N     │                      │
       ╱        Match that for Comm                 ╲──────▶│       Hang Up         │
        ╲       Device Number?                     ╱         └──────────────────────┘
         ╲────────────────╲      ╱────────────────╱
                           ╲    ╱
                             Y │
                              ▼
   36  ┌──────────────────────┐
    ⟍  │  Route Call to Interface │
       └──────────────────────┘
                              │
                              ▼
   37                        ╱╲
    ⟍                       ╱  ╲
         ╱────────────────╱      ╲────────────────╲         ┌──────────────────────┐  ⟍ 38
        ╱       Does Cash Register ID              ╲   N     │                      │
       ╱        Match that for                      ╲──────▶│       Hang Up         │
        ╲       Interface?                         ╱         └──────────────────────┘
         ╲────────────────╲      ╱────────────────╱
                           ╲    ╱
                             Y │
                              ▼
   39  ┌──────────────────────┐
    ⟍  │ Process Transaction Call │
       └──────────────────────┘
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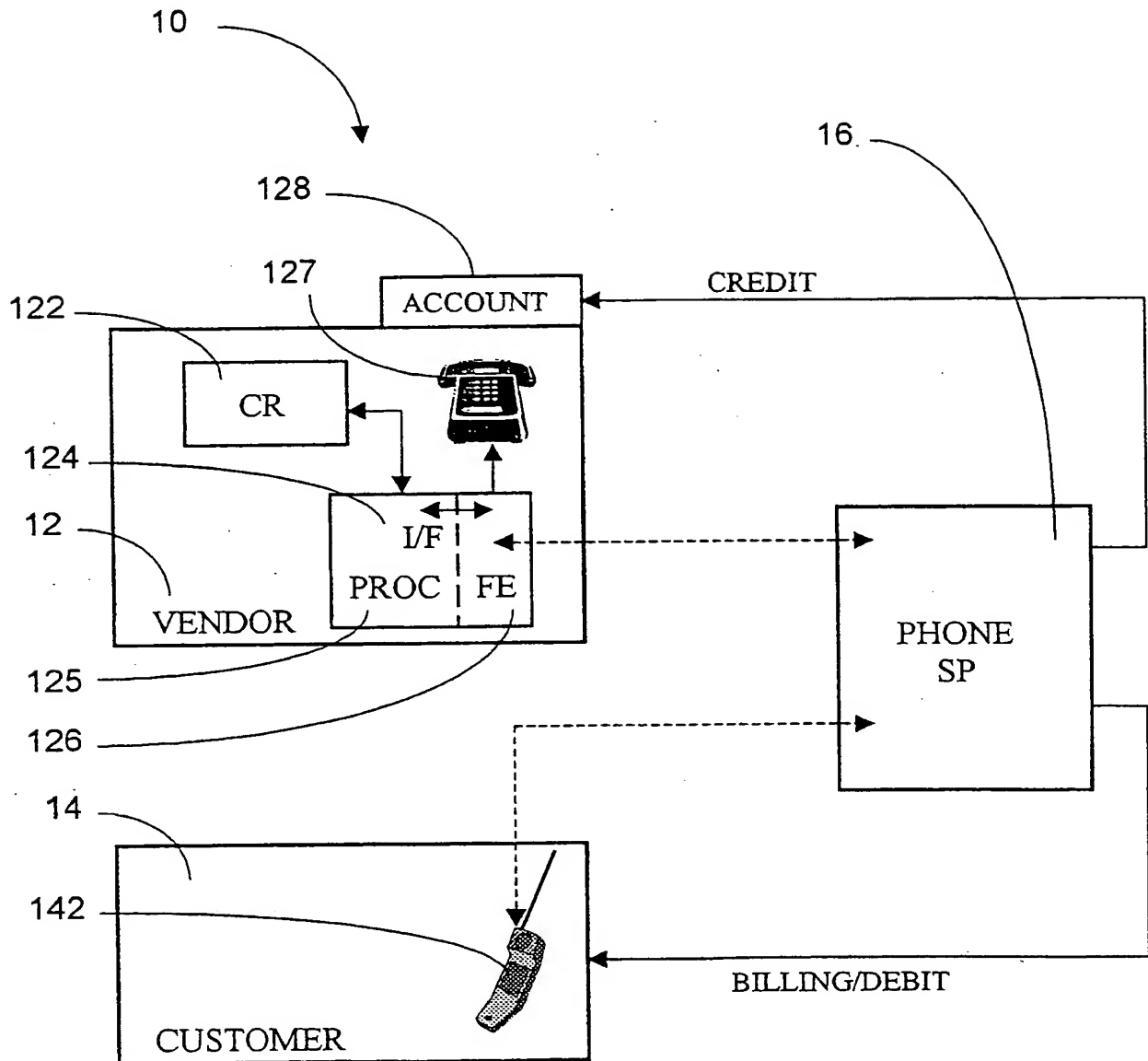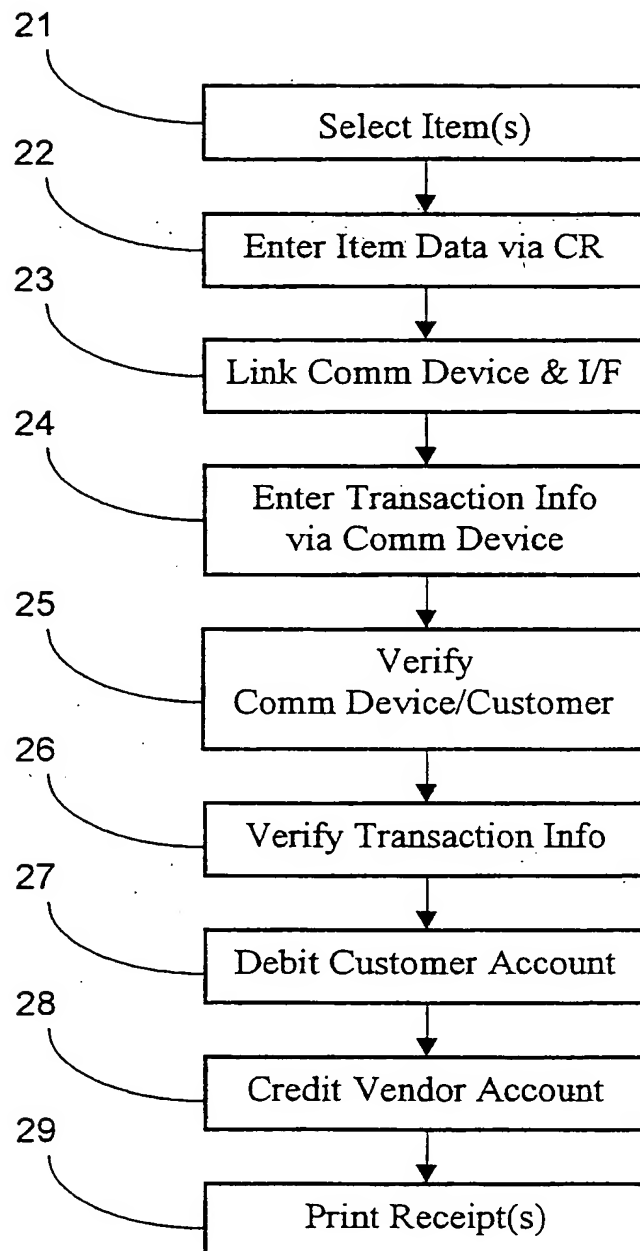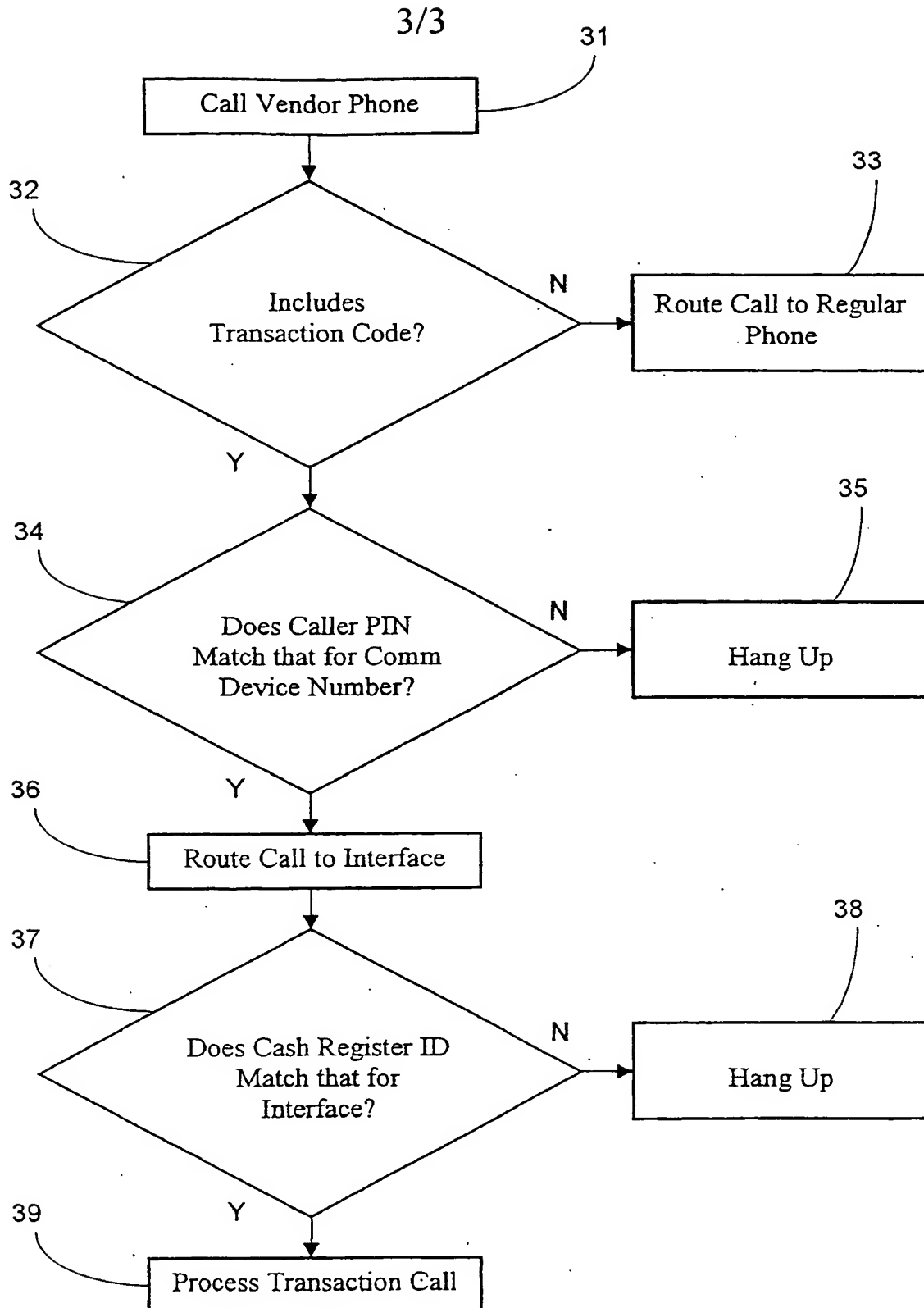
Figure 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL01/00102

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G06F 17/60; H04K 1/00; H04L 9/00
US CL :705/16, 16, 18, 64, 77, 78

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/16, 16, 18, 64, 77, 78

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Nokia Press Release, "Innovative vending machine application illustrates Nokia Card Phone's wide ranging utility," 05 June, 1998, see entire document.	1-18
Y	Press release, "PCS'98: Charge a Snack to Your Mobile Phone Bill; Aerial Communications and Nokia Bring Wireless Vending to U.S.," 23 September 1998, see whole document.	1-18
Y	Anon., "Products and Services on display at PCS '98," PCS Week, 30 September 1998, Vol. 9, No. 39, see last three paragraphs.	1-18
Y	Anon., "Banking on Electronics," Electronic Payments International, Februuary 1999, No. 139, see entire document.	1-18

[X] Further documents are listed in the continuation of Box C.   [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance		
"E"	earlier document published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 JUNE 2001	17 JUL 2001

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VINCENT MILL *Jannea R. Matthews*
Telephone No. (703) 308-1065 |

Form PCT/ISA/210 (second sheet) (July 1998)★

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Anon., "San Jose, Calif.-Based SnapTrack Signs Cellphone Agreement with Motorola," Orlando Sentinel, 02 May 1999, see especially paragrph beginning, "Rather than use credit cards . . ."	1-18
Y	Levin, C., "Care for a Teledrink?" PC Magazine, 01 August, 1999, see entire document.	1-18
Y	Gordon, J., "The Accidental Deal," Forbes, 15 November 1999, see especially fourth paragraph, "Sitting across a conference table . . ."	1-18
Y,P	Anon, "Ad Age's World Wire: Pepsi Machines to be Accessed by Mobile Phones," Advertising Age International Supplement, p. 3, February 2000, see entire document.	1-18
Y	EP 0 708 547 A2 (PARTRIDGE) 24 April 1996, see entire document.	1-18
A	WO 96/13814 A1 (VAZVAN) 09 May 1996, see entire document.	1-18
Y	EP 0 780 802 A2 (SALIMANDO) 25 June 1997, see especially Abstract; col. 1, line 40, through col. 2, line 31; col. 8,, lines 4-28; col. 12, ;ines 6-9.	1-18
X — Y	EP 0 848 360 A1 (ROSSMANN) 17 June 1998, see entire document.	1 ——— 2-18
A	WO 97/45814 A1 (VAZVAN) 04 December 1997, see entire document.	1-18
Y	WO 99/33034 A1 (DENNIS) 01 July 1999, see entire document.	1-18
Y	US 5,991,749 A (MORRILL) 23 November 1999, see entire document.	1-18
Y,P	EP 0 986 275 A1 (STADELMANN) 15 March 2000, see entire document.	1-18
Y,P	WO 00/58921 A1 (ATTIEH) 05 October 2000, see entire document.	1-18

B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

WEST·with·search terms: cell, cellular, mobile, telephone, telephones, phone, phones, pay, pays, payment, paid, paying, buy, buys, buying, bought, purchase, purchases, purchased, purchasing. DIALOG with more search terms: e.g. wireless, cellphone, radio, handheld, unit, device, apparatus, pager, terminal, appts, cash register, drawer, ECR, point, service, purchase, pos, epos, vending, machine, equipment, transaction, cashless, cash, money, credit, smart, debit, card, smartcard, communication, service, provider, subscriber, account, bill, billing, billed, statement, invoice, select, choos?, pick?, item, product, merchandise, ID, identification, number, pin, pins, record, store, storeage, verif?, authoriz?, authoris?, authenticat?, confirm?, vendor, merchant, seller, retailer.